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## PATENT ABSTRACTS OF JAPAN

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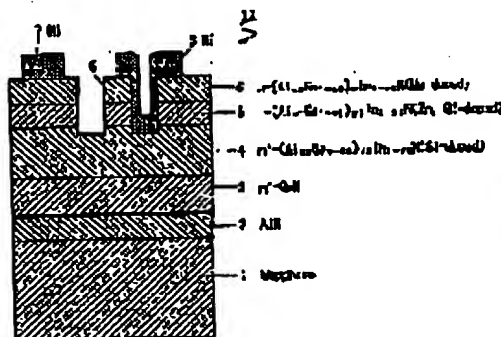
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### (54) METHOD FOR MANUFACTURE OF GROUP III NITRIDE SEMICONDUCTOR

#### (57)Abstract:

**PURPOSE:** To make hydrogen leave from a film and to prevent nitrogen from leaving the film by substituting atmospheric gas for an inactive gas other than H<sub>2</sub> gas and NH<sub>3</sub> gas until a room temperature is reached after the vapor growth of group III nitride semiconductor.

**CONSTITUTION:** AlN buffer layer 2 is formed on a sapphire substrate 1 and then a high-carrier concentration n<sup>+</sup> layer 3 consisting of GaN, a high-carrier concentration n<sup>+</sup> layer 4 consisting of (Al<sub>x</sub>2Ga<sub>1-x</sub>)<sub>2</sub>In<sub>1-y</sub>2N, a light-emitting layer 6 consisting of (Al<sub>x</sub>1Ga<sub>1-x</sub>)<sub>2</sub>y1N, and p-layer 6 consisting of (Al<sub>x</sub>2Ga<sub>1-x</sub>)<sub>2</sub>In<sub>1-y</sub>2N are formed on the buffer layer 2. Then, the supply of organic metal gas is stopped and the inside of a reaction room is exhausted in vacuum and then the inside is naturally cooled to a room temperature by introducing N<sub>2</sub> gas or inactive gas, thus enabling the p-layer 6 to be p-type semiconductor with a Hall concentration of 6 × 10<sup>17</sup>/cm<sup>2</sup> and a resistivity of 20Ωcm. As a result, by improving the crystallizability of a semiconductor thin film using AlGaInN, the light emitting intensity of a light-emitting element using the semiconductor can be improved.



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